

**WHAT IS CLAIMED IS:**

1           1. A method for preparing an on-spot hydrophilic  
2 enhanced slide, comprising the steps of:  
3           (a) preparing a hydrophobic copolymer in a solvent to  
4 obtain a solution of hydrophobic copolymer;  
5           (b) coating said solution of hydrophobic copolymer onto  
6 a substrate; and  
7           (c) removing said solvent.

1           2. The method as claimed in claim 1, wherein the  
2 hydrophobic copolymer is prepared by blending, grafting or  
3 co-polymerization of a hydrophobic material and a compound  
4 bearing a functional group selected from the group  
5 consisting of anhydride, imide, cyclic amide, and cyclic  
6 ester.

1           3. The method as claimed in claim 2, wherein the  
2 hydrophobic material is selected from the group consisting  
3 of styrene, urethane, ethylene, and derivatives thereof.

4           4. The method as claimed in claim 3, wherein the  
5 hydrophobic copolymer comprises poly(styrene-co-maleic  
6 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-  
7 maleic anhydride).

1           5. The method as claimed in claim 1, wherein the  
2 substrate comprises organic or inorganic substrate.

1           6. The method as claimed in claim 5, wherein the  
2 organic substrate comprises a polymer polymerized by

3 organic monomers, wherein said organic monomers is selected  
4 from the group consisting of a monomer of ethylene, styrene,  
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,  
6 and alkyl acrylate.

1 7. The method as claimed in claim 6, wherein the  
2 organic substrate comprises substrate consisting of  
3 poly(styrene-co-maleic anhydride), poly(styrene-co-  
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 8. The method as claimed in claim 5, wherein the  
2 inorganic substrate comprises silicon wafer, ceramic  
3 material, glass, or metal.

1 9. The method as claimed in claim 1, further comprising  
2 activating the substrate surface prior to the coating step.

1 10. The method as claimed in claim 9, wherein the  
2 activating step is treating the substrate surface with an  
3 acid or a base, or treating the substrate surface by plasma  
4 activation.

1 11. The method as claimed in claim 10, wherein the  
2 substrate is an inorganic substrate.

1 12. The method as claimed in claim 1, further  
2 comprising cleaning the substrate surface before step (b).

1 13. The method as claimed in claim 12, wherein the  
2 cleaning step is performed by the pretreatment with a  
3 solvent and/or sonication.

1           14. A method as claimed in claim 13, wherein the  
2 solvent is selected from the group consisting of surfactant,  
3 water, alcohol, and acetone.

1           15. The method as claimed in claim 1, wherein the  
2 coating step comprises spin coating, screen printing, roller  
3 coating, curtain coating, or dip coating.

1           16. The method as claimed in claim 15, wherein the  
2 coating step is spin coating.

1           17. The method as claimed in claim 1, wherein the step  
2 of removing solvent comprises vacuum evaporation, heating  
3 evaporation, or evaporation under reduced pressure.

1           18. The method as claimed in claim 17, wherein the  
2 heating evaporation is carried out at a temperature not  
3 higher than 100°C.

1           19. An on-spot hydrophilic enhanced slide, comprising:  
2           (i) a substrate; and  
3           (ii) a functionally active layer formed by a  
4 hydrophobic copolymer, wherein said layer is coated onto  
5 said substrate.

1           20. The slide as claimed in claim 19, wherein the  
2 hydrophobic copolymer is prepared by blending, grafting or  
3 co-polymerization of a hydrophobic material and a compound  
4 bearing a functional group selected from the group

5 consisting of anhydride, imide, cyclic amide, and cyclic  
6 ester.

1 21. The slide as claimed in claim 20, wherein the  
2 hydrophobic material is selected from the group consisting  
3 of styrene, urethane, ethylene, and derivatives thereof.

1 22. The slide as claimed in claim 21, wherein the  
2 hydrophobic copolymer comprises poly(styrene-co-maleic  
3 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-  
4 maleic anhydride).

1 23. The slide as claimed in claim 19, wherein the  
2 substrate comprises organic or inorganic substrate.

1 24. The slide as claimed in claim 23, wherein the  
2 organic substrate comprises a polymer polymerized by organic  
3 monomers, wherein said organic monomers is selected from the  
4 group consisting of a monomer of ethylene, styrene,  
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,  
6 and alkyl acrylate.

1 25. The slide as claimed in claim 24, wherein the  
2 organic substrate comprises substrate consisting of  
3 poly(styrene-co-maleic anhydride), poly(styrene-co-  
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 26. The slide as claimed in claim 23, wherein the  
2 inorganic substrate comprises silicon wafer, ceramic  
3 material, glass, or metal.

1           27. An on-spot hydrophilic enhanced microarray,  
2 comprising:  
3           (i) a substrate;  
4           (ii) a functionally active layer formed by a  
5 hydrophobic copolymer, wherein said layer is coated onto  
6 said substrate; and  
7           (iii) a biologically active material, which is  
8 immobilized onto said functionally active layer.

1           28. The microarray as claimed in claim 27, wherein the  
2 hydrophobic copolymer is prepared by blending, grafting or  
3 co-polymerization of a hydrophobic material and a compound  
4 bearing a functional group selected from the group  
5 consisting of anhydride, imide, cyclic amide, and cyclic  
6 ester.

1           29. The microarray as claimed in claim 28, wherein the  
2 hydrophobic material is selected from the group consisting  
3 of styrene, urethane, ethylene, and derivatives thereof.

1           30. The microarray as claimed in claim 29, wherein the  
2 hydrophobic copolymer comprises poly(styrene-co-maleic  
3 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-  
4 maleic anhydride).

1           31. The microarray as claimed in claim 27, wherein the  
2 substrate comprises organic or inorganic substrate.

1           32. The microarray as claimed in claim 31, wherein the  
2 organic substrate comprises a polymer polymerized by

3 organic monomers, wherein said organic monomers is selected  
4 from the group consisting of a monomer of ethylene, styrene,  
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,  
6 and alkyl acrylate.

1 33. The microarray as claimed in claim 32, wherein the  
2 organic substrate comprises substrate consisting of  
3 poly(styrene-co-maleic anhydride), poly(styrene-co-  
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 34. The microarray as claimed in claim 31, wherein the  
2 inorganic substrate comprises silicon wafer, ceramic  
3 material, glass, or metal.

1 35. The microarray as claimed in claim 27, wherein the  
2 biologically active material comprises nucleic acid,  
3 oligonucleotide, peptide, peptide nucleic acid, antigen,  
4 antibody, enzyme, or protein.

1 36. The microarray as claimed in claim 27, wherein said  
2 microarray is characterized by the on-spot hydrophilic  
3 enhancement when the use of immobilization of the  
4 biologically active materials.